Pioneering Tree Improvement in Oklahoma

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Abstract:--The pioneering tree improvement work in Oklahoma started in 1965 when Clayton Posey moved from Auburn University to Oklahoma State University. Clayton was hired by Glen Durrell (Department Head) to fill a teaching/research position in the Department of Forestry. As a native Oklahoman, Clayton recognized the need to start some long-term studies with the economically important timber species in the state. Fortunately he had access to McIntire-Stennis funds which he used to initiate studies with loblolly pine (*Pinus taeda*) shortleaf pine (*Pinus echinata*) and eastern cottonwood (*Populus deltoides*).

Tree selection started in 1966 and concurrently the Kiamichi Field Station was transferred to the Forestry Department from Horticulture. In typical Oklahoma fashion a strong spirit of cooperation emerged with Dierks Lumber Company (soon to be acquired by Weyerhaeuser), Herron Lumber Company, Oklahoma Forestry Division, and the Tiak District of the Ouachita National Forest all assisting with the program. The cooperative spirit was formalized in 1980 when the Oklahoma Forestry Division officially joined the Western Gulf Forest Tree Improvement Program.

SPECIES TRIALS:

The Oklahoma State Forestry Department was founded in 1946, just after World War II. A number of species trials were established in the early days, including plantations of loblolly pine near Lake Carl Blackwell, possibly planted by Mike Afanasiev. These loblolly plantings survived and grew well and eventually produced extensive stands of progeny. Unfortunately there are no known records of the original sources planted. Later plantings of loblolly seedlings from Oklahoma sources survived and grew well in the Payne County environment (Lantz 1977).

TREE IMPROVEMENT PIONEERS

The real tree improvement pioneer at OSU was Clayton Posey. Clayton completed his Ph. D. under Bruce Zobel at N. C. State University and moved to Auburn University in the early 1960's. Glenn Durrell (Department Head at OSU) hired Clayton to fill a new teaching/research position in 1965. When Clayton arrived in Stillwater he immediately saw the need to initiate long-term genetic studies with the three major commercial species in Oklahoma: loblolly and shortleaf pine, and cottonwood. Fortunately McIntire-Stennis funds were available and these were used to initiate the long-term studies.

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KIAMICHI STATION

The Kiamichi Station in Idabel was transferred from the Horticulture Department to Forestry in 1966-7. When the local people learned of the change they protested vigorously at the thought of their free veggies and peaches about to be replaced by rows of pine trees. The university prevailed, and soon there were pine trees all over with only a token few peach trees surviving.

Fortunately, Julius Canant and Truman Byrne, the resident horticultural technicians, were transferred to forestry along with their expertise in propagation and growing plants.

Clayton engineered a cooperative study with the USDA Forest Service, Southern Station, on hybrids between loblolly and slash pine. This study was planted just east of the station, on the north side of the highway. Reliable testimonials from former graduate students verified Clayton's dedication to the job. He was known for working students far into the night as they planted seedlings with the aid of headlights on the pickup trucks.

TREE SELECTION

Empirical evidence suggested that the pine tree improvement efforts be concentrated on 3 separate breeding programs: loblolly pine; low elevation shortleaf pine (below 1,000 feet in elevation) and mountain shortleaf (above 1,000 feet). Tree selections were started in natural stands in 1967 with the able assistance of the Oklahoma Forestry Division, Weyerhaeuser Company, U. S. Forest Service, Herron Industries, and several other private landowners. The N. C. State University grading system of five comparison trees in natural, even-aged stands was used.

GRAFTING

Field grafting started in 1967 for the three pine orchards. In later years vacant positions within the orchards were filled-in with transplants from a seedbed grafting area.

COTTONWOOD

Tree selection with cottonwood presented unique problems due to the general lack of even-aged stands and the common occurrence of vegetative reproduction. In most cases candidate trees were evaluated on their own merit, followed by planting in clonal banks via cuttings. These individuals were evaluated later by means of clonal tests.

JARI FLORESTAL

In the late 1960's Daniel Ludwig, a multi-millionaire shipping entrepreneur, started a new venture in the Amazon basin of Brazil on the banks of the Jari River. The project included cattle breeding, rice farming and plantation forestry. Ludwig recruited Clayton Posey to manage the forestry enterprise and Clayton left OSU in 1969. Close liaison continued with the Jari project, with Nat Walker and J. L. Albert working as consultants.

The 1974 OSU Forestry summer camp was held at the Jari site, Monte Dorado, with 40 students and 4 faculty attending.

NEW FACULTY MEMBERS

Roy Stonecypher replaced Posey in 1969. Roy had been working on the loblolly pine heritability study in Bainbridge GA for International Paper Company. Roy was also a Ph. D. graduate of NC State, and brought important quantitative skills to OSU.

Clark Lantz left NC State in the spring of 1970 to accept a new teaching/research position at OSU. Since Ted Silker was due to embark on a sabbatical Clark was elected to pinch-hit with Ted's courses, notably courses in Silviculture, Protection, and senior seminars. Roy and Clark shared the research projects with Roy working on the cottonwood and Clark on the pine.

Weyerhaeuser hired Roy in the early 1970's to be their primary quantitative geneticist in Centralia WA. Fortunately Floyd Bridgwater had studied under Roy long enough to handle the required quantitative studies when Roy left.

With Roy's departure, Clark assumed responsibilities for teaching the Forest Genetics and Regeneration course, the tree improvement research projects, and the seed orchard operations at Idabel.

GRADUATE STUDENTS

In the early 1970's Jerry Abbott started work on an MS project concerned with hybridization between loblolly and shortleaf in southeastern Oklahoma and Larry Miller started his MS work on crossing cottonwood in the greenhouse. A bit later, Cary Osterhaus started working on the Sarkey's Study, involving the conversion of Cross-Timbers sites to pine plantations.

NEW KIAMICHI STATION SUPERINTENDENT

The operation of the Kiamichi Station was critical to the maintenance and progress of the tree improvement programs. Ben Smith, a 1972 OSU Forestry graduate and retired Lt Commander-US Navy, had decided to move to Alaska and set-up a gold mining business, dredging shallow streams. Fortunately Clark was able to convince him to stay in Oklahoma and take the position of station superintendent. Ben had wide-reaching skills as a mechanic, plumber, electrician, and carpenter, and he was particularly good at improvising solutions to thorny problems. In those days federal surplus equipment was available to the state forestry organizations and Ben was a master at adapting much of that equipment to seed orchard use.

SEED PRODUCTION

The first improved seed from the Kiamichi seed orchards was harvested in 1972. Sufficient seed was collected from the loblolly orchard to plant an open-pollinated progeny test in February, 1975 (Smith and Tauer, 1982). The test plantation was planted in 4 reps of 12, 10-tree row plots. Information from additional open pollinated tests was used to rogue the loblolly orchard in 1982.

SARKEY'S STUDY

The Sarkey's study, located near Lamar, OK in Hughes County was originally set-up by Ted Silker to assess herbicides as a means of converting cross-timbers sites to pine plantations. Cary Osterhaus became interested in the study and his M. S. work was designed to compare survival and growth of loblolly, shortleaf, Virginia pine (*Pinus virginiana*) and *Pinus brutia* on the herbicide-treated site. Both loblolly and Virginia pines performed well on the Cross-Timbers site (Osterhaus and Lantz, 1978). Unfortunately an overzealous Agronomy faculty member set a "prescribed" fire on adjacent plots which completely destroyed the forestry study

MORE FACULTY CHANGES

Clark Lantz left OSU in December 1975 to join the U.S. Forest Service as Nursery/Tree Improvement Specialist in the Southern Regional office in Atlanta. Cary Osterhaus filled-in with teaching and research duties until he joined the Bureau of Land Management in Oregon. Chuck Tauer, a Ph. D. graduate of the University of Minnesota accepted the position in 1976.

WESTERN GULF FOREST TREE IMPROVEMENT PROGRAM

Chuck Tauer was instrumental in securing membership in the Western Gulf cooperative in 1980, a move that had been attempted previously without success. Through the 1970's the Oklahoma Forestry Division had assumed increasing responsibility for the tree improvement program and they now became an official member of the cooperative. Cooperative membership opened a number of doors for the state program: sharing reproductive material within the cooperative, design and analysis of progeny tests, advanced generation breeding plans, and improved communications within the forestry community. These have all paid big dividends in the last few years for the Oklahoma tree improvement program.

CONCLUSIONS

- Oklahoma students, staff and faculty worked hard to build a first rate tree improvement program.
- The spirit of cooperation seems to be a natural instinct for native Oklahomans.

This is what made the tree improvement program work when OSU, Oklahoma Forestry Division, Weyerhaeuser, U. S. Forest Service, Herron Industries, and numerous other private landowners all worked together for a common goal.

- Ben Smith, Julius Canant, and Truman Byrne always gave 200% at the Kiamichi Station.

- Students such as Floyd Bridgwater, Keith Lynch, Jimmie Buxton, Craig McKinley, Rex McCullough, Jerry Abbott, Larry Miller, and Cary Osterhaus put in long hours to keep the program moving.

- Strong support was always available from Al Myatt, Greg Huffman, Tom Smith, Kurt Atkinson and other members of the Oklahoma Forestry Division.

- Glen Durrell and Nat Walker of the OSU Forestry Department had the foresight to realize the potential of a state tree improvement program.

- Joining the Western Gulf Forest Tree Improvement Program was a major step forward

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